

REMARKS

Claims 1-26, 28-61 are pending in the application. Claims 1-26 and 28-61 stand rejected in the present final Office Action (“final Office Action”) mailed on February 5, 2007. Independent claims 1, 26, 32 and 57 are being amended in the Claim Listing above. Claim 62 is being added in the Claim Listing above. The claims being amended are being substantially reverted back to their respective forms as originally filed; therefore, Applicants respectfully submit that no new matter is being introduced by the amended claims. New Claim 62 includes the elements of Claim 1 as originally filed and also includes “first partial decoders” and “second partial decoders”, where support is found at least in Fig. 9 as originally filed, and, thus, also does not include new subject matter.

35 U.S.C. §112, First Paragraph

In part 3 of the first Office Action mailed on June 8, 2006, and referenced in part 3 of the final Office Action, Claims 1 and 57 were rejected under 35 U.S.C. §112, first paragraph for being directed towards single means claims. Applicants note that Claims 1 and 57 are being reverted to substantially the same form that received a “single means claim” rejection. In the first Office Action, the claims were said to be “means” claims and consequently were said to be subject to an undo breath rejection, apparently as described by MPEP 2164.08(a). As submitted in the response to first Office Action on November 8, 2006, on page 20, Applicants submitted remarks that Claims 1 and 57 are not “means” claims. MPEP 2818(I) sets forth the requirements for a claim to be a “means” claims. Specifically, the claim elements must use the phrase “means for” or “step for”, which must be modified by functional language, and the “means for” must not be modified by sufficient structure. Neither Claims 1 nor 57, as originally filed or as now amended, include the “means for” language and, consequently, are not “means” claims. Moreover, amended claim 1 recites, “a processor ... to generate at least partially decoded near end signals and at least partially decoded far end signals ... to adjust said first parameter ... and to replace at least said first parameter ... to reduce echo in the near end digital signal.” Amended independent claim 57 includes similar elements. A processor is well known to include many operational units, such as an arithmetic logic unit, memory, and so forth. Further, the specification as originally filed indicates on page 16, lines 12 - 15 that the “[p]rocessor 40 may

be a microprocessor, microcontroller, digital signal processor, or other type of logic unit capable of arithmetic and logical operations.”

In view of the foregoing remarks, Applicants respectfully submit that claim 1 does not have undo breadth and that the rejection under 35 U.S.C. §112, first paragraph should be withdrawn.

Applicants are presenting new Claim 62 that includes a near end partial decoder and far end partial decoder in addition to the processor as recited in now amended Claim 1. If the rejection under 35 U.S.C. §112, first paragraph, is maintained for Claims 1 and 57, in spite of the remarks submitted hereinabove and in response to the first Office Action with respect to the rejection under §112, first paragraph, Applicants request a discussion with the Examiner to consider whether the additional elements presented in Claim 62 would be sufficient to overcome the rejection.

35 U.S.C. §101

In parts 4-6 of the final Office Action, Claims 57-61 were rejected under 35 U.S.C. §101 because the claimed invention is said to be directed to non-statutory subject matter (MPEP 2106 [R-3], IV) for being merely a manipulation of the abstract data in a processing device that does not in and of itself, produce a useful, concrete, and tangible result.

Claim 57, as amended, now recites, “transmitting the first and second bits in an adjusted state to a far end device to present the first and second bits in audio form to an end user.” Accordingly, Applicants respectfully submit that amended Claim 57, and its dependent claims, claims 58-61, now comply with 35 U.S.C. §101. Accordingly, Applicants respectfully submit that the rejection under 35 U.S.C. §101 is now overcome.

Corresponding independent claim 26 is being amended in a similar manner.

35 U.S.C. §112, Second Paragraph

In parts 7 and 8 of the present final Office Action, Claims 1-26 and 28-31 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. As stated on page 4 of the final Office Action, “it is uncertain whether the Applicant is claiming the system

shown in FIG. 9 or simply the network coded domain echo control (CDEC) device (element 40) because the preamble refers to the echo reducing apparatus, but the body of the claim refers to the overall system shown in FIG. 9 (i.e., the originating transmitters are located in the handsets).” The final Office Action also provides helpful suggestions for overcoming the rejection. Applicants thank Examiner for offering the suggestions.

Based on the amendments submitted in amended Claims 1 and 26 in the Claim Listing above, claims 1 and 26 are directed to the Coded Domain Echo Control (CDEC) device, element 40 of Fig. 9. Accordingly, Applicants respectfully submit that the rejection under 35 U.S.C. §112, second paragraph, is now moot and respectfully requests withdrawal of the rejections.

Dependent Claims 2-25 and 28-31 should be allowable under 35 U.S.C. §112, second paragraph because they depend from base Claims 1 and 26.

35 U.S.C. §103(a)

In parts 9 and 10 of the final Office Action, Claims 1-4, 7-12, 15-16, 18-26, 32-35, 38-43, 46-47 and 49-57 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour *et al.* (U.S. Patent Number 6,011,846) (“Rabipour”) in view of Chen (U.S. Patent Number 5,651,091) (“Chen”).

In an amendment filed on November 8, 2006 responsive to the first Office Action, Applicants’ amended Claim 1 to introduce an element, “subframe.” Responsive to the introduction of “subframe,” Chen was combined with Rabipour to change a rejection under 35 U.S.C. §102(e) as being anticipated by Rabipour, as presented in the first Office Action, to a rejection of Claim 1 under 35 U.S.C. §103(a) as being obvious based on a combination of Rabipour and Chen, as presented in the final Office Action. In the Claim Listing above, Applicants are amending Claim 1 to remove the previously introduced element, “subframe.” Because Chen is being used specifically in the final Office Action to address the element “subframe,” Applicants respectfully submit that the rejection under 35 U.S.C. §103(a) is no longer applicable; however, Applicants submit that the rejection reverts back to the rejection in the first Office Action dated June 8, 2006, in which Rabipour was cited as anticipating Claim 1 under 35 U.S.C. §102(e). Applicants address the prior rejection under 35 U.S.C. §102(e) immediately below.

Before addressing the specific rejections, Applicants believe a brief discussion of the invention as claimed in Claim 1 and Rabipour may be useful.

Claim 1 as now amended recites, in part, a “processor ... to generate at least partially decoded near end signals and at least partially decoded far end signals.” Claim 1 also recites, in part:

a processor...responsive to said at least partially decoded near...[and] far end signals...to replace at least said first parameter with said adjusted first parameter in said near end digital signal to reduce echo in the near end digital signal,

where the underlined text indicates elements being added by way of amendment in the Claim Listing above. Thus, Applicants’ invention as claimed in Claim 1 at least partially decodes near and far end digital signals and adjusts at least one parameter to reduce echo in the near end digital signal.

Examples of parameters that can be modified include codebook gain, codebook vector, pitch synthesis filter, LPC synthesis filter, and corresponding example techniques that can be used to modify the parameters are presented on pages 21-29 of the application as originally filed. For example, as described in reference to the pitch synthesis filter parameters on pages 23-26, the pitch synthesis filter parameters are modified based on echo and/or speech in the near end signal. A variable, likelihood of echo (p) may be used to change processing to calculate the pitch synthesis filter parameters. By at least partially synthesizing the speech signal, information is learned and applied to adjust at least one parameter to reduce echo in the near end digital signal. Adjusting at least one parameter can improve the speech signal reproduced at the far end by “varying degrees” to reduce echo in the reproduced speech signal to be audibly presented to the far end user (i.e., listener).

In contrast, Rabipour applies a simpler technique of applying echo suppression. For example, in terms of adjusting parameters, Rabipour either adjusts the parameters or not (i.e., ON or OFF adjustment) (see Rabipour, FIGs. 2B and 2C (paths C and D), Fig. 3 (left and right paths), and Fig. 4 (lower “no” and “yes” paths)). Rabipour makes the decision of whether to adjust parameters or not by extracting the parameters, estimating energy of echo based on energy within a spectrum, and either replacing the parameters (in the case of echo) or allowing the parameters to pass unchanged (in the case of no echo). Applicants refer to Rabipour’s replacing

the parameters or allowing the parameters to pass as a “binary” echo suppression system. Thus, since Rabipour’s echo suppression system operates in a “binary” (i.e., ON or OFF) manner rather than in a “varying degrees” manner as claimed in Applicants’ amended claim 1, Rabipour does not anticipate all elements of Applicants’ Claim 1 (“...replace at least said first parameter...to reduce echo in the near end digital signal”).

Moreover, Rabipour teaches away from Applicants’ amended Claim 1 because Rabipour does not synthesize a speech signal (i.e., “at least partially decode a speech signal”). See Rabipour Abstract, line 5, (“without synthesizing a speech signal”).

Further, Rabipour’s binary echo suppression system would require substantial modification to perform in a manner as claimed in Applicants’ Claim 1 because, without the information provided by the decoding, Rabipour’s “binary” echo suppression cannot simply be extended to Applicants’ “varying degrees” echo suppression. In other words, Rabipour’s estimates of energy of echo in a digital signal is enough to determine whether to reduce echo or not, but Rabipour’s estimates of energy of echo are not enough to “replace at least said first parameter” to determine how to reduce echo in varying degrees.

In view of the foregoing, Applicants respectfully submit that Claim 1 as now amended overcomes the rejection under 35 U.S.C. §102(e) and 35 U.S.C. §103(a).

Independent Claim 32 is being amended in the Claim Listing above to include similar elements as now amended Claim 1 and should be allowed for similar reasons.

Because Claims 2-4, 7-12, 15, 16, and 18-25 depend from amended claim 1 and claims 33-35, 38-43, 46, 47, and 49-56 depend from amended claim 32, Applicants respectfully submit that these claims should be allowed for at least the same reasons as the base claims from which they depend.

With regard to independent claims 26 and 57 and their respective dependent claims, independent Claim 57 is being amended to recite “adjusting first bits [using a compression code] and second bits [using a linear code] ... to reduce echo characteristics of [a] near-end digital signal.” The invention of claims 26 and 57 may be used in a system in a network employing bits with a combination of a compression code and linear code, referred to herein as a “hybrid coded/linear format,” such as in a case of transmitting speech in a legacy system that employs Time Division Multiplexing (TDM) with eight bit slots in which the speech is represented, for

example, with two bits of a coded domain signal and six bits of a Pulse Code Modulation (PCM), μ law or A-law signal in the linear domain (see Applicants' originally filed FIG. 3; page 18, line 13 through page 19, line 2; and page 30, line 17 through page 31, line 3).

Rabipour does not contemplate operation in a network with a hybrid coded/linear format and, therefore, Applicants respectfully submit Rabipour does not and cannot anticipate every element of Applicants' Claim 57 ("adjusting first bits [using a compression code] and second bits [using a linear code] ... to reduce echo characteristics of [a] near-end digital signal").

Accordingly, Applicants respectfully submit that Claim 57 should be allowed under 35 U.S.C. 103(a) or 35 U.S.C. §102(e).

Amended independent Claim 26 includes similar elements as now amended Claim 57 and should be allowed for at least the same reasons.

New independent Claim 62 is similar to amended Claim 1 but also includes near- and far-end partial decoders. Accordingly, Applicants respectfully submit that new Claim 62 sufficiently distinguishes over the cited references.

In part 11 of the final Office Action, Claims 5-6, 13-14, 36-37, and 44-45 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen and further in view of Strawczynski *et al.* (U.S. Patent Number 6,138,022) ("Strawczynski"). Because these claims depend from base claims that should be allowable under 35 U.S.C. 103(a) or 35 U.S.C. §102(e) for reasons presented above, Applicants respectfully submit these dependent claims should be allowed for at least the same reasons.

In part 12 of the final Office Action, Claims 17 and 48 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen and further in view of Christensson *et al.* (U.S. Patent Number 6,510,224) ("Christensson"). Because these claims depend from base claims that should be allowable under 35 U.S.C. 103(a) or 35 U.S.C. §102(e) for reasons presented above, Applicants respectfully submit these dependent claims should be allowed for at least the same reasons.

In part 13 of the final Office Action, Claims 28-31 and 58-61 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen and further in view of Navaro *et al.* (U.S. Patent Number 6,108,560) ("Navaro"). Because these claims depend from base claims that should be allowable under 35 U.S.C. 103(a) or 35 U.S.C. §102(e) for reasons

presented above, Applicants respectfully submit these dependent claims should be allowed for at least the same reasons.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims, claims 1-26 and 28-62, which will be pending after entry of this Amendment, are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Mark B. Solomon
Mark B. Solomon
Registration No. 44,348
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

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